CLAIMS:

1. A process for extracting oil, protein, carbohydrates, shell, and minor toxic components from seeds comprising the steps of:

a. dehulling oil seed to separate out the shell and the kernel;

b. compressing said kernel obtained in step (a) into flakes at room temperature;

c. agitating and mixing said flakes obtained in step (b) with a mixture of dephenolizers for a period of time at a specific temperature to obtain a filtrate and dephenolized kernel flakes, which together form a dephenolization mixture;

d. mixing said filtrate obtained in step (c) with a complexing compound to form a gossypol complex;

e. hydrolyzing, crystallizing, filtering, and washing said gossypol complex to yield industrial gossypol;

f. treating said dephenolized kernel flakes obtained in step (c) with liquid propane and butane to yield oil and pulp;

g. dissolving said pulp derived from said oil extraction in an alkali to yield a protein waste solution upon precipitation; and

h. adding saturated limewater to said protein waste solution obtained in (g), followed by precipitation and filtration of residual gossypol, electrolysis, and condensation to yield carbohydrates.

2. The process of claim 1, wherein said oil seed kernel is directly flaked or cold pressed.

3. The process of claim 1, wherein said mixture of dephenolizers comprises an alcohol, a suitable acid, and an enzyme.

4. The process of claim 3, wherein said alcohol is selected from the group consisting of methanol and ethanol.

5. The process of claim 3, wherein said suitable acid is selected from the group consisting of nitric acid, hydrochloric acid, and phosphoric acid.

6. The process of claim 3, wherein in said mixture of dephenolizer, the alcohol concentration is in a range from 65%-99%, the acid concentration is from 3%-85%, and the enzyme concentration is in a range from 0.4-65μg/ml.

7. The process of claim 3, wherein the weight ratio of alcohol concentration to the acid to the enzyme is in the range of 10-15.0 (alcohol concentration): 0.005-0.05 (acid): 0.00006-0.0009 (enzyme).

8. The process of claim 3, wherein the weight ranges of said alcohol concentration to said acid to said enzyme is in the ranges of 10-15 : 0.005-0.05 : 0.00006-0.009.

9. The process of claim 4, wherein the weight ranges of said alcohol concentration to said acid to said enzyme is in the ranges of 10-15 : 0.005-0.05 : 0.00006-0.009.

10. The process of claim 5, wherein the weight ranges of said alcohol concentration to said acid to said enzyme is in the ranges of 10-15 : 0.005-0.05 : 0.00006-0.009.

11. The process of claim 1, wherein the weight ratio of said dephenolization mixture to said oil seed kernel is in the range of 3-5 : 1

12. The process of claim 1, wherein the dephenolization time is in the range of fifteen (15) minutes to eighteen (18) hours

13. The process of claim 1, wherein the temperature for the dephenolozation of step c is in the range of 0°C-70°C.

14. The process of claim 1, wherein said complexing compound is selected from the group consisting of aniline and chromium.

15. The process of claim 1, wherein the weight ratio of liquid propane and butane to oil seed kernel is in the range of 0.5-9 : 1

16. The process of claim 1, wherein the elution time for step f is in the range of ten (10) minutes to eight (8) hours.

17. The process of claim 1, wherein said process further comprises the step of separating gossypol from seed, wherein the seed oil-complex hydrolyzation additive comprises an acid selected from the group consisting of sulphuric acid and nitric acid, an antioxidant, and acetone with weight ratio in the range of 5-15 : 1-7 : 11-45, respectively.

18. The process of claim 17, wherein the weight ratio of said hydrolyzation additive to seed oil-complex is in the range of 11-25 : 3-16.

19. The process of claim 1, wherein the process of step e further comprises the step of forming aniline-gossypol complex that is subjected to hydrolyzation, crystallization, filtration, and washing to yield an industrial gossypol.

20. The process of claim 1, wherein the process further comprises the step of adding propane and butane to dephenolized kernel for extraction of oil.

21. The process of claim 1, wherein the process further comprises the steps of adding alkaline solution to dissolve the pulp derived from oil extraction, centrifugation, protein precipitation, bleaching and spray drying to yield protein.

22. The process of claim 21, wherein after centrifugation and before spray drying, proteolytic enzyme is added for hydrolyzation to yield hydrolyzed protein.

23. The process of claim 1, wherein the process further comprises the steps of:

a. treating protein waste solution and waste solution from hydrolyzation of gossypol complex by evaporation and filtration;

b. adding of saturated limewater;

c. filtration and electrolysis of residual gossypol; and

d. condensation of residual solution to yield carbohydrates.

24. The process of claim 1, wherein said protein waste solution and waste water from hydrolyzation are treated to recover useful components such as ethanol and water-soluble protein.

25. The process of claim 1, wherein the seed is selected from the group consisting of cottonseed, rubber seed, sunflower seed, safflower seed, peanut, flax seed, hemp seed, rape seed, poppy seed, and any other suitable seed.

26. The process of claim 1, further comprising performing a supercritical extraction to obtain oil and to flush away the residual dephenolizer.

27. A seed oil produced according to the process of claim 1.

28. An apparatus for producing the seed oil comprising:

a. an oil seed dehuller to separate out the shell and the kernel;

b. a flaking machine to compress said kernel obtained in step (a) into flakes at room temperature;

c. an agitated leaching tank in which to mix said flakes obtained in step (b) with a mixture of dephenolizers for a period of time at a specific temperature to obtain a filtrate and to dephenolized kernel flakes, which together form a dephenolization mixture;

d. a complexing tank vessel in which said filtrate obtained in step (c) is mixed with a complexing compound to form a gossypol complex;

e. a hydrolyzation tank in which to hydrolyze, crystallize, filter, and wash said gossypol complex to yield industrial gossypol;

f. an immersion tank in which to treat said dephenolized kernel flakes obtained in step (c) with liquid propane and butane to yield oil and pulp;

g. a protein extraction tank in which to dissolve said pulp derived from said oil extraction in an alkali to yield a protein waste solution upon precipitation; and

h. an apparatus in which to add saturated limewater to said protein waste solution obtained in (g), followed by precipitation and filtration of residual gossypol, electrolysis, and condensation to yield carbohydrates.

29. The apparatus of claim 28, wherein said oil seed kernel is directly flaked or cold pressed.

30. The apparatus of claim 28, wherein said mixture of dephenolizers comprises an alcohol, a suitable acid, and an enzyme.

31. The apparatus of claim 30, wherein said alcohol is selected from the group consisting of methanol and ethanol.

32. The apparatus of claim 30, wherein said suitable acid is selected from the group consisting of nitric acid, hydrochloric acid, and phosphoric acid.

33. The apparatus of claim 30, wherein in said mixture of dephenolizer, the alcohol concentration is in a range from 65%-99%, the acid concentration is from 3%-85%, and the enzyme concentration is in a range from 0.4-65μg/ml.

34. The apparatus of claim 30, wherein the weight ratio of alcohol concentration to the acid to the enzyme is in the range of 10-15.0 (alcohol concentration): 0.005-0.05 (acid): 0.00006-0.0009 (enzyme).

35. The apparatus of claim 30, wherein the weight ranges of said alcohol concentration to said acid to said enzyme is in the ranges of 10-15 : 0.005-0.05 : 0.00006-0.009.

36. The apparatus of claim 31, wherein the weight ranges of said alcohol concentration to said acid to said enzyme is in the ranges of 10-15 : 0.005-0.05 : 0.00006-0.009.

37. The apparatus of claim 32, wherein the weight ranges of said alcohol concentration to said acid to said enzyme is in the ranges of 10-15 : 0.005-0.05 : 0.00006-0.009.

38. The apparatus of claim 28, wherein the ratio of said dephenolization mixture to said oil seed kernel is in the range of 3-5 : 1

39. The apparatus of claim 28, wherein the dephenolization time is in the range of fifteen (15) minutes to eighteen (18) hours

40. The apparatus of claim 28, wherein the temperature for the dephenolization of step c is in the range of 0°C-70°C.

41. The apparatus of claim 28, wherein said complexing compound is selected from the group consisting of aniline and chromium.

42. The apparatus of claim 28, wherein the weight ratio of liquid propane and butane to oil seed kernel is in the range of 0.5-9 : 1

43. The apparatus of claim 28, wherein the elution time for step f is in the range of ten (10) minutes to eight (8) hours.

44. The apparatus of claim 28, in which step e further comprises:

the step of separating gossypol from seed, wherein the seed oil-complex hydrolyzation additive comprises an acid selected from the group consisting of sulphuric acid and nitric acid, an antioxidant, and acetone with weight ratio in the range of 5-15 : 1-7 : 11-45, respectively.

45. The apparatus of claim 44, wherein the weight ratio of said hydrolyzation additive to seed oil-complex is in the range of 11-25 : 3-16.

46. The apparatus of claim 28, wherein the apparatus further comprises:

the step of forming aniline-gossypol complex that is subjected to hydrolyzation, crystallization, filtration, and washing to yield an industrial gossypol.

47. The apparatus of claim 28, further comprising adding propane and butane to dephenolized kernel in said agitated leaching tank for extraction of oil.

48. The apparatus of claim 28, further comprising the steps of adding alkaline solution to dissolve the pulp derived from oil extraction, centrifugation, protein precipitation, bleaching and spray drying to yield protein.

49. The apparatus of claim 48, wherein after centrifugation and before spray drying, proteolytic enzyme is added for hydrolyzation to yield hydrolyzed protein.

50. The apparatus of claim 28, wherein the apparatus further comprises:

a. an apparatus for treating protein waste solution and waste solution from hydrolyzation of gossypol complex by evaporation and filtration;

b. an apparatus in which to add saturated limewater;

c. a filter for the filtration and electrolysis of residual gossypol; and

d. a condenser of residual solution to yield carbohydrates.

51. The apparatus of claim 28, wherein said protein waste solution and waste water from hydrolyzation are treated to recover useful components such as ethanol and water-soluble protein.

52. The apparatus of claim 28, wherein the seed is selected from the group consisting of cottonseed, rubber seed, sunflower seed, safflower seed, peanut, flax seed, hemp seed, rape seed, poppy seed, and any other suitable seed.

53. The apparatus of claim 28, further comprising an apparatus in which to perform a supercritical extraction to obtain oil and to flush away the residual dephenolizer.